



09/459703

CofC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kiran A. Padwekar

Examiner: Meonske, Tonia

Patent No.: 7,100,027

Group Art Unit: 2181

Issue Date: August 29, 2006

Docket No: 884.027US1

Title: SYSTEM AND METHOD FOR REPRODUCING SYSTEM EXECUTIONS USING A REPLAY
HANDLER (As Amended)

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

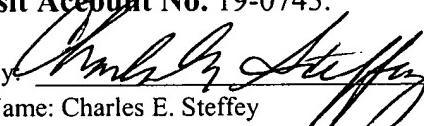
ATTN: CERTIFICATE OF CORRECTION BRANCH

We are transmitting herewith the attached:

- Authorization to charge Deposit Account No. 19-0743 in the amount of \$100.00 to cover the Certificate of Correction fee.
- Certificate of Correction Form - PTO-1050 (1 page)
- A return postcard.

Please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.SCHWEGMAN, LUNDBERG & WOESSNER P.A.

Customer No: 21186

By 
Name: Charles E. Steffey
Reg. No.25,179
CES:CMG:sj

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria VA 22313-1450, on this 19 day of May 2008.

Name

Richard Beck

Signature

Richard BeckRECEIVED
PATENT & TRADEMARK OFFICE

MAY 27 2008

Patent 7,100,027

PATENT

IN UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,100,027

Docket No: 884.027US1

Issue Date: August 29, 2006

Patentee: Kiran A. Padwekar

Customer No.: 21186

Confirmation No.: 1539

Title SYSTEM AND METHOD FOR REPRODUCING SYSTEM EXECUTIONS USING A
REPLAY HANDLER (As Amended)

REQUEST FOR CERTIFICATE OF CORRECTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
ATTN: CERTIFICATE OF CORRECTION BRANCH



It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. A copy of the text of the Certificate in the suggested form are enclosed.

Issuance of the Certificate of Correction would neither expand nor contract the scope of the claims as properly allowed, and re-examination is not required.

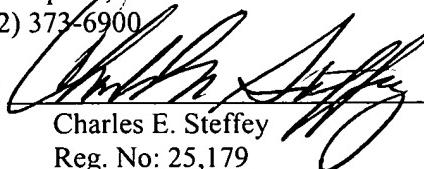
Pursuant to 1.20(a), please charge Deposit Account No. 19-0743 in the amount of \$100.00.

The Examiner is authorized to charge any additional fees or credit overpayment to Deposit Account No.19-0743.

Respectfully Submitted
KIRAN A. PADWEKAR

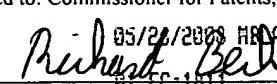
By his Representatives,

SCHWEGMAN LUNDBERG & WOESSNER P.A
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6900

Date : May 16, 2008
By: 
Charles E. Steffey
Reg. No: 25,179
CES:sj

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450, on this 16 day of May 2008

Richard Beck
Name


05/21/2008 RMANCO 00000002 190743 7100027
Signature 01 FC:1011 100.00 DA

RECEIVED - USPTO
Patent and Trademark Office

MAY 27 2008

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,100,027

Page (1) of 1

DATED : August 29, 2006

INVENTOR(S) : Padwekar

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the face page, in field (75), in "Inventor", in column 1, line 1, delete "Santa Clara" and insert - - San Jose - -, therefor.

On the face page, in field (56), under "Other Publications", in column 2, line 1, after "L." insert - - , - -.

On the face page, in field (56), under "Other Publications", in column 2, lines 4-5, delete "techdd. htm" and insert - - techdd.htm - -, therefor.

MAILING ADDRESS OF SENDER:

SCHWEGMAN, LUNDBERG & WOESSNER P.A.
P.O. BOX 2938
Minneapolis, MN 55402

Atty Docket No: 884.027US1

PATENT NO. 7,100,027

No. of additional copies

RECEIVED
FEDERAL REGISTER

MAY 27 2008

SCHWEGMAN LUNDBERG WOESSNER KLUTH

Issued Patent Proofing Form

Note: P = PTO Error

S = SLWK Error

SLWK: 884.027US1

Proofread By: Sidharth (09/07/2006)

US Serial No.: 09/459,703

US Patent No.: US 7,100,027 B1

Issue Dt.: Aug. 29, 2006

Title: SYSTEM AND METHOD FOR REPRODUCING SYSTEM EXECUTIONS USING A REPLAY HANDLER

PR Instructions: Face Page, Claims and Abstract

Sr. No.	P/S	Original		Issued Patent		Description of Error
		Page	Line	Column	Line	
1	P	Page 2 of 3 Oath or Declaration filed (04/10/2000)	1 (Inventor's Residence)	First Page Col. 1 (Inventor)	1	Delete "Santa Clara" and insert -- San Jose --, therefor.
2	P	Page 1 of 1 List of references cited by examiner (06/30/2004)	Entry 1 Line 1 (Non-Patent Documents)	First Page Col. 2 (Other Publications)	1	After "L." insert ---, ---.
3	P	Page 1 of 1 List of references cited by examiner (01/12/2005)	Entry 1 Line 1 (Non-Patent Documents)	First Page Col. 2 (Other Publications)	4-5	Delete "techdd.htm" and insert -- techdd.htm --, therefor.

MAY 27 2008



US007100027B1

(12) **United States Patent**
Padwekar

(10) **Patent No.:** US 7,100,027 B1
(b4) **Date of Patent:** Aug. 29, 2006

(54) **SYSTEM AND METHOD FOR
REPRODUCING SYSTEM EXECUTIONS
USING A REPLAY HANDLER**

(75) Inventor: Kiran A. Padwekar, Santa Clara, CA
(US)

(73) Assignee: Intel Corporation, Santa Clara, CA
(US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/459,703

(22) Filed: Dec. 13, 1999

(51) **Int. Cl.**

G06F 11/30 (2006.01)
G06F 11/36 (2006.01)

(52) U.S. Cl. 712/227; 712/228; 714/17;
714/25; 717/127

(58) **Field of Classification Search** 712/227,
712/228; 714/17, 25, 30; 717/127-135
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,688,263 A	8/1972	Balogh, Jr. et al.	..... 340/172.5
4,095,268 A	6/1978	Kobayashi et al.	..... 364/200
5,301,198 A *	4/1994	Kawasaki	..... 717/131
5,530,804 A *	6/1996	Edgington et al.	..... 703/28
5,555,249 A	9/1996	Hilley et al.	..... 371/21.1
5,678,003 A	10/1997	Brooks	..... 395/183.1
5,704,033 A	12/1997	Park	..... 395/183.06
5,724,505 A *	3/1998	Argade et al.	..... 714/45
5,740,413 A	4/1998	Alpert et al.	..... 395/568
5,758,059 A	5/1998	Alexander	..... 395/183.06
5,951,696 A	9/1999	Naaseh et al.	..... 714/34
5,963,737 A *	10/1999	Mealey et al.	..... 710/260
6,065,106 A *	5/2000	Deao et al.	..... 712/24

6,125,416 A	9/2000	Warren	..... 710/71
6,212,626 B1 *	4/2001	Merchant et al.	..... 712/218
6,240,509 B1 *	5/2001	Akkary	..... 711/207
6,247,118 B1 *	6/2001	Zumkehr et al.	..... 712/228
6,311,292 B1 *	10/2001	Choquette et al.	..... 714/30
6,343,358 B1 *	1/2002	Jaggard et al.	..... 712/227
6,349,397 B1	2/2002	Koga et al.	..... 714/727
6,356,960 B1	3/2002	Jones et al.	..... 710/5
6,598,112 B1	7/2003	Jordan et al.	..... 347/221
6,877,086 B1 *	4/2005	Boggs et al.	..... 712/218
6,925,584 B1	8/2005	Padwekar et al.	

OTHER PUBLICATIONS

Hennessey, John L. et al., Computer Architecture A Quantitative Approach, Second Edition, 1996, Morgan Kaufman Publishers, Inc., pp. 39-41.*
http://www.d.umn.edu/~jmackiew/comp3130_moreinfo_techdd.htm publication date unknown.*

Borland C++ for Windows User's Guide, 1993, Borland International, Inc., version 4.0, pp. 103-122.*

* cited by examiner

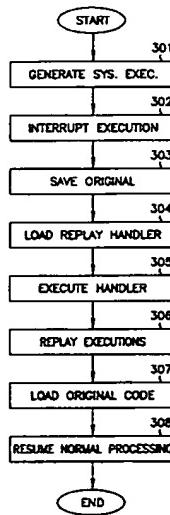
Primary Examiner—Fritz Fleming
Assistant Examiner—Tonia L. Meonske

(74) Attorney, Agent, or Firm—Schwegman, Lundberg, Woessner & Kluth, P.A.

(57) **ABSTRACT**

Methods and systems for replaying arbitrary system executions are disclosed. A system includes a storage element, a memory hierarchy and a processor. The memory hierarchy is coupled to the storage element. The processor is coupled to the memory hierarchy. The processor executes instructions from the memory hierarchy. A replay handler is loaded into the memory hierarchy. The replay handler is executed for replaying at least one execution. In another embodiment, a method for replaying executions is disclosed. Normal execution of a processor is interrupted. A replay/restart kernel is loaded. At least one execution is replayed. Normal execution of the processor is resumed.

18 Claims, 4 Drawing Sheets



RECEIVED-USPTO
Patent Publication

MAY 27 2008

REC
P...
P...

MAY 27